EXHIBIT R

Does Voluntary Financial Disclosure Matter? The Case of Fairness Opinions in Mergers and Acquisitions

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Abstract

We use the shifting nature of Delaware's disclosure requirements for fairness opinions in tender offers to assess the impact of voluntary versus mandatory disclosure. To do so, we obtain the disclosures of details in fairness opinions by the targets of over 900 tender offers from 1995 to 2019. Over this period, the disclosure regime for tender offers transitioned from a voluntary one to a mandatory one. We document that the disclosure rates of details in fairness opinions are low under voluntary rules and rise steadily as Delaware courts became increasingly insistent on the disclosure of these details. We also show that proshareholder changes to tender offers are associated with disclosure of tender offer details only under the voluntary regime. These results highlight the complexity of predicting the effects of disclosure rules and provide empirical support for theoretical work that argues that mandatory-disclosure regimes can narrow opportunities to signal.

1. Introduction

Louis D. Brandeis famously said that "sunlight is said to be the best of disinfectants" to promote vigorous and copious financial disclosure (Brandeis 1913, p. 10). While this principle seems like a commonsense aspiration, research has found that the social benefit of disclosure in capital markets can be more complex and even negative. In the financial context, disclosure can serve to protect the issuer from litigation risk instead of benefiting the recipient (Davidoff and Hill 2013). Complex disclosure can lead to heuristic biases (Paredes 2003). Meanwhile, markets can be inefficient in processing information, at least in the short

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term, and disclosure can be overly burdensome (Davidoff and Hill 2013). There is also a vigorous debate over the virtues of mandatory versus voluntary disclosure and the need for the former over the latter (Coffee 1984; Polinsky and Shavell 2012).

We use the shifting nature of Delaware disclosure requirements for fairness opinions in tender offers to assess the impact of voluntary versus mandatory disclosure in mergers and acquisitions (M&A) transactions. Unlike transactions structured as a merger—in which the disclosure of fairness opinion details has long been required—the disclosure obligations for transactions structured as tender offers have shifted over recent decades. In this study, we scrape the details from over 900 disclosures from targets of tender offers that span these changes in disclosure regimes. The sample, which encompasses 1995 to 2019, covers three distinct approaches taken by Delaware courts to disclosure in tender offers. Prior to 2000, Delaware courts said little about the need to divulge the details of fairness opinions when a firm was the target of a tender offer. In this initial period, disclosure was essentially voluntary. Around 2001, Delaware courts concluded that this information could be material to shareholders, but a series of cases during that period gave mixed messages about the level of detail required. Tender offer targets thus had to balance the costs of additional disclosure against a relatively low prospect of liability. By 2007, it became clear that a failure to disclose the relevant details of a fairness opinion would bring a significant risk of fiduciary liability. Disclosure of fairness opinion details was essentially mandatory if a firm sought to avoid liability.

Across these time periods, we observe significant variation in whether firms disclose the details of fairness opinions in tender offers. Prior to 2000, when Delaware courts had said little about the practice, disclosure rates range from 6 percent to 16 percent. The era of uncertain guidance from 2000 to 2007 saw disclosure rates climb steadily from 27 percent to 62 percent. As Delaware courts became more insistent on the disclosure of the details, rates climbed to 87 percent in 2008 and stayed above 90 percent until reaching 100 percent disclosure in 2015.

These changing rules provide insight into the value of disclosure under both voluntary and mandatory regimes. The theoretical literature on disclosure emphasizes that when disclosure is voluntary, a firm's decision to disclose will turn on what it signals by its choices. In the context of tender offers, a target is able to send signals both through the mere fact of disclosure and through the details it discloses. Potential audiences for this information include the target's shareholders, other investors (including merger arbitrageurs), and other potential acquirers. Fairness opinion details can inform these parties about how the tender offer compares to the firm's internal valuation. That the target is willing to release this type of information may indicate whether it believes that the bidder is willing to pay a higher price and any new information about a potential topping bid.

Disclosure of fairness opinion details is likely to be of most interest in low-premium deals. When the premium is high, the chances that shareholders will

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not tender or that a topping bid will emerge is lower (Walkling 1985; Hirshleifer and Png 1989; Betton and Eckbo 2000). But these outcomes are more likely when the premium is low. If the target has signaled that the bidder may be willing to pay more or that there is potential for a topping bid by disclosing the fairness opinion details, merger arbitrageurs may flood into the market for the target's stock. Their ability to coordinate may create a credible threat that an insufficient number of shares will be tendered. That pressure may lead a bidder to increase the price of the tender offer. Likewise, other potential acquirers may be willing to bid if they believe that the internal valuation is close to the tender offer price. That prospect may also lead the original bidder to increase its offer price.

We find evidence consistent with these expectations before 2008, when disclosure of fairness opinion details was not mandatory. During that time, targets strategically utilized their discretion to disclose fairness opinion details. To be more specific, we find that targets were more willing to provide detailed disclosures of fairness opinions when bidders made low-premium offers. These disclosures were associated with subsequent price increases in transactions with low premiums. Price increases are larger when the discounted cash flow (DCF) range discloses a higher valuation for the target firm. Thus, we identify a channel through which disclosure plausibly communicates material information to market participants. We further analyze disclosure choices by investment banks and law firms and find that disclosure of fairness opinions is more likely to occur when a top-five investment bank is retained.

We conduct this analysis in both the pre-2008 period when disclosure was voluntary and highly variant and in the latter years when the disclosure was more uniform and effectively mandatory (but still subject to some discretion by targets). Disclosure effects disappear once disclosure is more mandatory for targets. In other words, since 2007, nearly all targets disclose the details of fairness opinions, and the outcomes associated with voluntary disclosure disappear.

We acknowledge that there are identification issues with our analysis. To be more specific, before 2008 the disclosure of tender offers was a choice, and so it is possibly correlated with other characteristics of deals including unobservable variables. In addition, our analysis utilizes a break point of 2008, but other work shows a general decline in the market impact of corporate disclosure in recent years. Our analysis may thus be showing a more general decline in informativeness. To address these endogeneity issues, we compile and analyze a comparable sample of mergers over the same time period and find that the pattern among tender offers—declining informativeness of disclosure over time—does not appear in the mandatory-disclosure regime of mergers. As a result, our primary findings do not appear to be driven by this type of endogeneity.

Our findings highlight the value of voluntary disclosure in M&A and capital markets generally. They also highlight the potential costs of mandatory disclosure. Targets utilize their disclosure option to provide a signal to the market concerning their valuation. This effect, however, disappears when disclosure is more uniform, which indicates that investors are no longer able to detect any signal

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that voluntary disclosure creates. Our results thus have policy implications for the use of mandatory disclosure in M&A and highlight that such rules may have unintended effects.

2. Legal Framework and Hypothesis Development

2.1. Tender Offer and Merger Structures

In an M&A transaction, parties face a choice in structuring the transaction. They can proceed through a merger in which the target merges with a subsidiary of the buyer. Alternatively, the buyer can conduct a tender offer that seeks greater than 50 percent of the target. After the tender offer closes, the buyer then proceeds to squeeze out the remaining shares in a back-end merger (Comment and Jarrell 1987). The choice of structure (that is, merger versus tender offer) is generally dictated by the speed with which the buyer wishes to proceed (Hill, Quinn, and Solomon 2019). Tender offers are viewed as quicker to achieve control of the target. However, a straight merger structure is used if the transaction is expected to take longer because of factors such as antitrust approvals or financing. Because of this choice, there is substantial heterogeneity in structure. Approximately 19 percent of transactions in a recent study were structured as tender offers (Boone, Broughman, and Macias 2018).

2.2. Fairness Opinions

In a public M&A transaction it is customary for a target's board to receive a fairness opinion from the target's financial advisor. A fairness opinion is a letter addressed to the target's board of directors stating that the transaction is "fair from a financial point of view" (Davidoff 2006, p. 1565). While the letter is short, the value of a fairness opinion is in the underlying analysis. The investment bank conducts a DCF valuation, comparable company analysis, or other valuation to arrive at a fairness opinion. One study finds that in 1998–2005 over 96 percent of M&A targets received a fairness opinion (Cain and Denis 2013).

Historically, if the acquisition is structured as a merger, a proxy statement is filed. Schedule 14A (proxy statements) filed pursuant to the Securities Exchange Act of 1934 and registration statements on form S-4 (merger prospectuses) filed pursuant to the Securities Act of 1933 require the disclosure of a summary of any such fairness opinion, but only if the fairness opinion is referenced in the merger proxy or prospectus. This disclosure can be reviewed by the Securities and Exchange Commission (SEC) and encompasses disclosure of the various valuation techniques the investment bank utilizes and the underlying figures. The Online Appendix contains a sample fairness opinion from the acquisition of Fitbit by Google, which was completed in 2020. Included are the calculation of the DCF range and disclosure of the underlying assumptions such as various discount

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rates and projections. In the case of a comparable company analysis, the companies selected and the range of valuations are disclosed.

This disclosure is not required in tender offers. The Williams Act tender offer rules under the Exchange Act do not require the disclosure of the information required by a proxy statement. Targets however can voluntarily provide such disclosure under federal law.

Historically, the federal law was the only driver of fairness opinion disclosure in takeover transactions (and as noted, no disclosure was mandatory in a tender offer). This regime was revised because of developments under Delaware law, the site of incorporation of a majority of US public companies. In 2000, the Delaware Supreme Court confirmed in *Skeen v. Jo-Ann Stores Inc.* (750 A. 2d 1170 [Del. 2000]) that information in a fairness opinion (for example, a company's internal financial projections, the methodologies used, and the ranges of values generated by the financial analyses performed by its financial advisor) is not per se material under Delaware state law and is consequently not required to be disclosed absent a showing that it is inconsistent with or significantly differs from disclosed information.

The Delaware court's ruling in *Skeen* appeared to hold that the information in fairness opinions was not required under Delaware state law. However, in a case decided shortly after the *Skeen* ruling, the lower Delaware court appeared to hold differently. In 2002 Vice Chancellor Leo Strine in *In re Pure Resources* (808 A.2d 421 [Del. Ch. 2002]) held that he considered projections and a fair summary of the financial analyses underlying a financial opinion (including a summary of the valuation methodologies used and the ranges of values generated) to be material and required to be disclosed in a tender offer.

After Strine's opinion in *Pure Resources,* the differing opinions led to increasing disclosure of fairness opinion details in tender offers. This usage was not uniform, however, and was not required for companies incorporated outside Delaware. Another lower Delaware court, in *In re Netsmart* (924 A.2d 171 [Del. Ch. 2007]), then ruled again that the disclosure of information provided by fairness opinions is material and required under Delaware law. After *Netsmart,* practitioners began to view the state laws as requiring disclosure of a fairness opinion regardless of whether the company was incorporated in Delaware (Rohrbacher and Zeberkiewicz 2008). Figure 1, which tracks the disclosure rate of details over time for tender offers, is consistent with this account.

2.3. Hypothesis Development

In a voluntary-disclosure regime, the question for the target's board is whether to disclose the content of a fairness opinion and, if so, how much of the associated detail to disclose. Disclosing this information imposes costs on the target, including the time and effort necessary to prepare the disclosure, the increased threat of a lawsuit that may come with a more detailed disclosure, and the re-

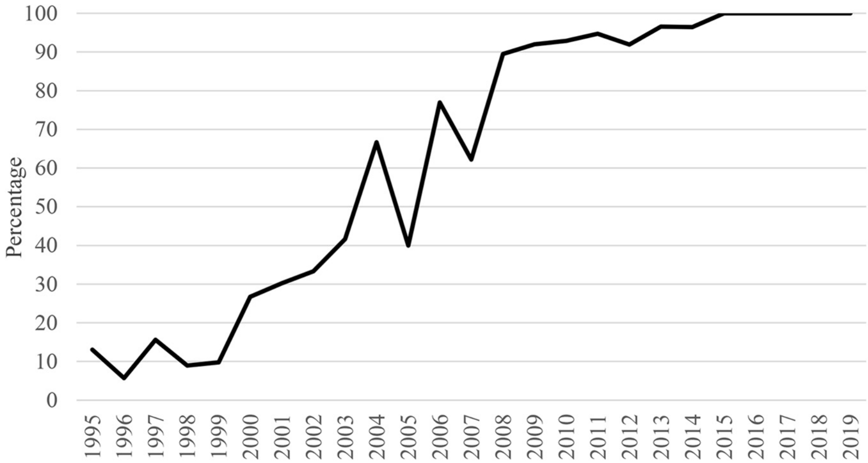

Figure 1. Disclosure of fairness opinion valuation details over time

lease of potentially sensitive information to competitors. But the most pressing risk is likely to be the possibility that the target's shareholders will turn against the transaction on the basis of the information in the fairness opinion. If shareholders believe that the board has not achieved a high enough price, there is a possibility that they will not tender enough shares to meet the required threshold (typically a majority).[1]

Under a mandatory-disclosure regime, the ability to send a signal about the value of the deal and the target's confidence about potential topping bids is diminished. In this situation, shareholders cannot infer anything from the decision to release the details. If the mandatory-disclosure regime makes it more difficult to signal that the target may have underpriced itself, that could result in shareholders receiving a lower share of the surplus in tender offer deals. In contrast, in a voluntary regime the target can use a fairness opinion disclosure to signal to investors and outsiders whether the deal is fairly priced and to alert shareholders to outside options.

We develop three related hypotheses. The first concerns our expectations about when disclosure is voluntary. We assume that disclosure is costly because, among other reasons, a firm must pay professional advisors to prepare and vet the disclosures and because the release of the information may reveal proprietary information to competitors. We also assume that the benefits of disclosing details are likely to vary. High-premium tender offers have little risk that too few shares will be tendered, and they are unlikely to attract topping bids. Costly disclosure is unlikely to be attractive for these targets. Low-premium offers, however, do face these possibilities and the benefits that come with them. We thus expect to

[1] Recall that, in a tender offer, tendering shares is functionally equivalent to voting in favor of the merger.

observe variation in the disclosure of details in a fairness opinion when disclosure is voluntary.

The second hypothesis addresses the consequences of releasing the details of a fairness opinion under different disclosure regimes. The tender offer model developed by Offenberg and Pirinsky (2015) provides some helpful guidance for our analysis. They assume, consistent with the evidence, that tender offers are completed more quickly on average than mergers. Tender offers are thus especially attractive to bidders that fear topping bids. In their model, targets of tender offers know this and will demand a higher premium based on the target's uninformed estimate of what a potential topping bidder would be likely to pay. But as the tender offer process plays out, the target may learn that third-party bidders would be willing to pay more than its estimate. In those situations, the target may wish to signal to its shareholders that the price is too low in the hope that the original bidder will adjust its price upward. This signaling is much more effective in a voluntary regime, and we thus expect to observe larger upward price revisions during that period. The ability to send a more meaningful signal should produce more meaningful consequences.

Our final hypothesis relates to the level of detail of the valuation released by targets. Targets can release varying amounts of detail. Perhaps the most important detail that a firm can provide is a specific range for value per share. That information allows shareholders to compare the value determined by the investment bankers with the one in the tender offer. We expect that the release of this information is more likely to alert shareholders to a low tender offer price. In turn, that should make it more likely that there will be an upward adjustment in the tender offer price.

3. Empirical Analysis

3.1. Data

We compile a sample of tender offer acquisitions from the SDC Platinum database. The sample comprises 914 tender offers for public targets from 1995 to 2019 for which we can identify a form 14D-9. Form 14D-9 allows the target to make certain disclosures about the tender offer (and thus the content of the disclosure is within the control of the target). We identify whether the target files a fairness opinion and then examine whether there is disclosure of the underlying analysis. We code the nature of the underlying analysis and the range of the DCF analysis, if any. We obtain additional financial information and control variables from the SDC Platinum database.

3.2. Summary Statistics

Table 1 reports the yearly sample of tender offers for the period we examine. Tender offers were more prevalent in the 1990s (and prior years) but have held somewhat steady on an absolute basis in the 21st century, at roughly several

Table 1
Sample of Tender Offers over Time

	Without Fairness Opinion	With Fairness Opinion	Total
1995	1	23	24
1996	0	35	35
1997	1	77	78
1998	1	67	68
1999	2	102	104
2000	0	86	86
2001	2	43	45
2002	1	21	22
2003	0	12	12
2004	0	9	9
2005	1	15	16
2006	1	13	14
2007	2	45	47
2008	2	38	40
2009	2	25	27
2010	1	42	43
2011	0	38	38
2012	0	37	37
2013	0	29	29
2014	0	28	28
2015	1	32	33
2016	0	23	23
2017	0	29	29
2018	0	12	12
2019	0	15	15
Total	18	896	914

dozen a year. Virtually all tender offer documents mention the use of a fairness opinion in connection with the proposed transaction. Only 18 tender offers fail to mention a fairness opinion over the 25-year sample period. Thus, their use by targets in tender offers has remained fairly ubiquitous.[2]

For the sample of 896 tender offers that disclose that the target received a fairness opinion, Table 2 reveals that 52 percent include valuation details. However, this rate is fairly low in the 1990s, with a sample minimum of only 6 percent of transactions in 1996. The disclosure rate increases to 27 percent in 2000, then gradually increases to 89 percent in 2008. The rate remains above 90 percent in all subsequent years and holds steady at 100 percent in 2015 and beyond. Figure 1 reports this increasing trend.

[2] While tender offers are commonly used, they are used less often in private-equity and management buy-out transactions. Management buy-out transactions constitute only 1 percent of transactions in our sample, while private-equity buyers are only about 4 percent of our sample.

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Table 2

Disclosure of Fairness Opinion Valuation Details over Time

	No Valuation Details	Valuation Details Disclosed	Percentage with Valuation Details
1995	20	3	13
1996	33	2	6
1997	65	12	16
1998	61	6	9
1999	92	10	10
2000	63	23	27
2001	30	13	30
2002	14	7	33
2003	7	5	42
2004	3	6	67
2005	9	6	40
2006	3	10	77
2007	17	28	62
2008	4	34	89
2009	2	23	92
2010	3	39	93
2011	2	36	95
2012	3	34	92
2013	1	28	97
2014	1	27	96
2015	0	32	100
2016	0	23	100
2017	0	29	100
2018	0	12	100
2019	0	15	100
Total	433	463	52

In unreported tests, we examined whether disclosure rates differ by whether the firm is incorporated in Delaware or another state—but we did not observe statistically significant differences between states. Figure 2 reports the annual medians for offer premia and the ratio of fairness opinion valuation to offer over the course of the sample. Both metrics are relatively stable.

In making a disclosure of a fairness opinion, a target not only has a choice about whether to make such a disclosure but also to assess the type and quality of analysis undergirding the fairness opinion. Eaton et al. (2022) provide additional details on comparable valuation multiples analysis, Shaffer (2019) explores DCF analysis, and Cain and Denis (2013) provide further details on all of these approaches in the context of fairness opinions. Table 3 reports the frequencies of valuation techniques employed by investment banks and disclosed in the details of fairness opinions.

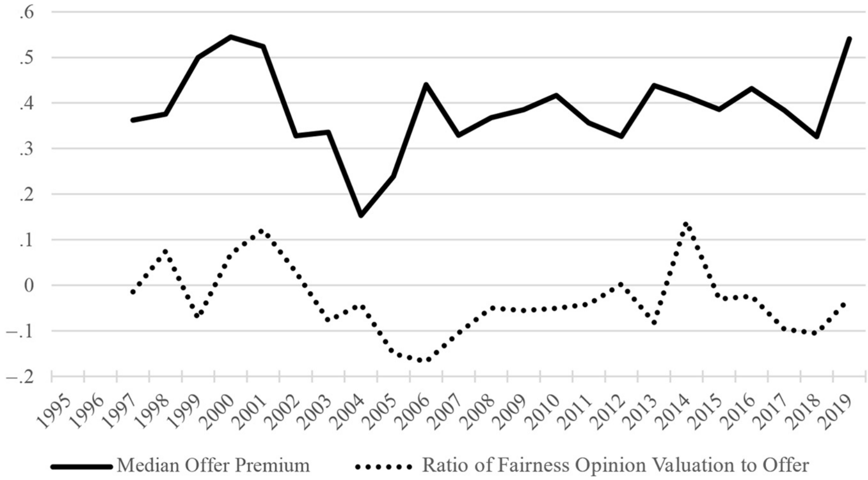

Figure 2. Median offer premium and ratio of fairness opinion valuation to offer over time

Table 3
Frequency of Valuation Techniques

	N	Percentage
Discounted cash flow	429	92.66
Comparable company multiples	440	95.03
Prior transaction premiums or multiples	442	95.46
All three techniques	388	83.80
Other	178	38.44

We next turn to empirically examine the sample in light of our hypotheses. Table 4 reports descriptive statistics for the key variables employed in subsequent empirical models: Tender Offer Percentage Change is the percentage change from the original tender offer price to the final offer price,[3] Log Transaction Value is the value in millions of dollars, Cross Industry is an indicator equal to one if the target and acquirer are in different Standard Industrial Classification codes, Target Delaware Incorporated is an indicator equal to one for targets incorporated in Delaware, Low Offer is an indicator variable equal to one if the initial offer premium relative to the target price 4 weeks prior falls within the bottom 30th percentile of offers for all tender offers that year, and DCF Valuation is

[3] The SDC Platinum database reports publicly announced deals, including those withdrawn prior to closing. This approach could complicate the construction of Tender Offer Percentage Change if announced deals are often withdrawn in favor of a higher offer from a competing bidder. In that case, it would be preferable to calculate the change by comparing the difference between the withdrawn offer and the winning offer. This is not a problem for our analysis because nearly all the original parties close the announced deals: of the 914 deals in our sample, 912 closed. This suggests that if a potential topping bid emerges, the original parties reprice the deal rather than withdraw it.

Table 4
Univariate Statistics

	N	Mean	SD	Min	25th Percentile	Median	75th Percentile	Max
Tender Offer Percentage Change	914	2.00	9.06	−35.00	.00	.00	.00	152.93
Transaction Value	914	1,296	2,694	100	212	468	1,248	46,694
Log Transaction Value	914	6.34	1.18	4.61	5.36	6.15	7.13	10.75
Cross Industry	914	.32	.47	.00	.00	.00	1.00	1.00
Target Delaware Incorporated	914	.68	.47	.00	.00	1.00	1.00	1.00
Low Offer	914	.28	.45	.00	.00	.00	1.00	1.00
DCF Valuation	416	−3.76	27.99	−96.86	−15.63	−5.75	3.46	279.28

Table 5

Discounted Cash Flow Valuations Relative to Tender Offer Prices

	Mean	Median
Low-offer deals	−.29	−2.32
High-offer deals	−5.22	−7.57

Note. Mean and median valuations are relative to initial tender offer prices. Wilcoxon rank-sum test = .007 (p = .01).
** Significant at the 1% level.

the percentage difference between the average DCF valuation of the target in the fairness opinion and the initial tender offer price.

With the exception of DCF Valuation, which is available only for transactions that disclose such valuation details in connection with the fairness opinions,[4] all variables are available for the full sample. At the median (mean), the DCF valuation implies that the target is worth 5.75 percent (3.76 percent) less than the tender offer price. This is consistent with the tendency of investment banks to value targets below offer prices in negotiated merger proxy statements as documented in Cain and Denis (2013) and Shaffer (2019). However, there is significant heterogeneity in this valuation: the interquartile range is −15.63 percent to 3.46 percent.

3.3. Empirical Results

We begin the empirical analysis by exploring the information undergirding a decision by the target to disclose a fairness opinion. In this regard, we first examine whether, when disclosure is made, the DCF valuations in fairness opinions are correlated with initial offer premiums.

Table 5 reports the mean and median DCF valuations relative to tender offer prices for low-offer deals and high-offer deals. Both the mean and the median DCF valuations are correlated with offers: low initial tender offers have DCF valuations that imply that the targets' values are almost equal to the offer premiums. In contrast, high initial tender offers have DCF valuations that imply that the targets' values are lower than the offer premiums. The difference in medians is statistically significant at the 99 percent level. Consistent with prior literature, this represents evidence that voluntary disclosure of fairness opinions is utilized by targets to signal information to shareholders (Ekmekci and Kos 2014; Shaffer 2019).

[4] This number of transactions, 416, is slightly lower than the previous total for discounted cash flow valuations because of a handful of observations that report results in a way that is difficult to compare against the tender offer price on a per-share basis (for example, reporting aggregate enterprise value, value of a subsidiary, and so on).

Table 6

Changes in Tender Offer Prices and Discounted Cash Flow Valuations

	Full Sample	High Offers	Low Offers
Constant	31.573**	18.112**	2.927
	(.000)	(.007)	(.779)
Log Transaction Value	−.011	−.079	.277
	(.968)	(.790)	(.708)
Cross Industry	−1.456*	−1.632*	−2.556+
	(.015)	(.019)	(.076)
Target Delaware Incorporated	−.108	−.192	−1.474
	(.891)	(.773)	(.392)
DCF Valuation	4.252	−.147	20.911**
	(.128)	(.928)	(.002)
N	416	293	123
R^2	23.18	15.03	60.15

Note. Results are from ordinary least squares regressions; *p*-values from robust standard errors are in parentheses. All regressions include individual and year fixed effects. The sample is restricted to deals disclosing discounted cash flow valuation ranges in the fairness opinions.

+ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

We next analyze the relationship between disclosure of the DCF valuation and changes in tender offer price. Previous research documents the potential value relevance of these analyses prepared by investment banks utilizing nonpublic information about the target company's future expected cash flows (for example, Cain and Denis 2013; Shaffer 2019). To the extent that the DCF valuation in a fairness opinion of the target is higher—that is, closer to or above the tender offer price—we predict that the bidder will be pressured into raising the bid if shareholders or other potential bidders view this information as value relevant.

Table 6 reports ordinary least squares (OLS) regressions with the dependent variable equal to the percentage change in tender offer price multiplied by 100. The results for low offers present the test of the primary hypothesis and demonstrate that among tender offers with low initial bids for targets, a higher disclosed DCF valuation is associated with an upward revision of the bid. This effect is statistically significant at the 1 percent level. In terms of economic magnitude, moving from the 25th to the 75th percentile in DCF Valuation in Table 4 represents a change of about 19 percent. Multiplying this by the coefficient on DCF Valuation in Table 6 results in a bid revision of roughly 4 percent.

We next investigate whether the DCF valuation disclosure effect holds across the entire time period we examine or whether it is concentrated during the time in which target companies exercised the greatest discretion over voluntary disclo-

Table 7
Changes in Tender Offer Prices and Discounted Cash Flow Valuations by Period

	Full Sample	1995–2007	2008–19
Constant	9.583	−1.358	.656
	(.266)	(.911)	(.760)
Log Transaction Value	−.076	−1.170	.180
	(.786)	(.132)	(.561)
Cross Industry	−1.671**	−5.925*	−.805
	(.006)	(.017)	(.129)
Target Delaware Incorporated	.107	−.721	.152
	(.879)	(.720)	(.821)
DCF Valuation	−.002	−2.137	.508
	(.999)	(.240)	(.832)
Low Offer	1.650*	3.899+	.050
	(.046)	(.065)	(.949)
DCF Valuation × Low Offer	25.155**	40.838**	7.867
	(.003)	(.000)	(.137)
N	416	103	313
R^2	32.58	55.73	8.06

Note. Results are from ordinary least squares regressions with a dependent variable equal to Tender Offer Percentage Change × 100 and p-values from robust standard errors in parentheses. All regressions include individual and year fixed effects. The sample is restricted to deals disclosing discounted cost flow valuation ranges in the fairness opinions.
+ Significant at the 10% level.
* Significant at the 5% level.
** Significant at the 1% level.

sure decisions. Table 7 reports the models for the 1995–2007 subsample and documents a similarly positive coefficient that is statistically significant at the 1 percent level. The coefficient on the interaction term for 2008–19 is positive but not quite statistically significant at the 10 percent level. Thus, the evidence indicates that the signaling effect of disclosure is most concentrated in the time period of maximum discretion over voluntary disclosure.[5]

One potential endogeneity concern is omitted-variables bias. It is possible that corporate filings have become less informative over time. Brown and Tucker (2011) examine a large sample of the Management Discussion and Analysis section of companies' SEC filings. They find that over time the sections have become more wordy but less informative and useful for investors. Similarly, it is possible that disclosures in tender offer documents have become less informative over time. If so, our results could be driven not by the shift from voluntary to manda-

[5] Because these results are central to our analysis, we assess their robustness by running the same regressions with 25th percentile and 35th percentile cutoffs for the definition of low-premium deals. In both cases, the results are essentially unchanged. These results are also robust to measuring the offer premium 5 months prior to announcement, which is the time period suggested by Eaton, Liu, and Officer (2021). Brown, Liu, and Mulherin (2022) also document that, in recent decades, targets' boards have lengthened the timeline of the negotiation process.

Table 8

Changes in Merger Offer Prices and Discounted Cash Flow Valuations by Period

	1995–2007	2008–19
Constant	.551	−.438
	(.864)	(.848)
Log Transaction Value	−1.031	−.446*
	(.241)	(.012)
Cross Industry	−.501	.624
	(.672)	(.429)
Target Delaware Incorporated	2.446	.298
	(.328)	(.657)
DCF Valuation	1.907	.346**
	(.336)	(.000)
Low Offer	3.615+	.458
	(.086)	(.534)
DCF Valuation × Low Offer	−1.932	−.303
	(.332)	(.201)
N	416	451
R^2	6.01	13.09

Note. Results are from ordinary least squares regressions with a dependent variable equal to Tender Offer Percentage Change × 100 and *p*-values from robust standard errors in parentheses. All regressions include individual and year fixed effects. The sample is restricted to merger deals disclosing discounted cash flow valuation ranges in the fairness opinions.

+ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

tory disclosure regimes but rather by an omitted variable reflecting the general decline in the informativeness of corporate disclosures over time.[6]

To assess this possibility, we conduct a robustness check by focusing on a separate sample of mergers. Disclosure of the valuations in fairness opinions has been mandatory over the entire time period of the sample. Thus, we would not expect to observe the same pattern of informativeness of DCF valuations among low-offer deals in the merger samples if the pattern is driven by a shift from voluntary to mandatory disclosure; no such shift took place among mergers. If, however, our results are caused by a general decline in the informativeness of corporate disclosures over time, then the same pattern among tender offers would be likely to persist among mergers.

We collect a sample of DCF valuations in fairness opinions among mergers using the same criteria as our tender offer sample: deals announced from 1995 through 2019 included in the SDC Platinum database. The results of these regressions are presented in Table 8. For 1995–2007, both DCF Valuation and DCF Valuation × Low Offer are insignificant. Moreover, the magnitudes of the coef-

[6] We thank a referee and the editor for raising this possibility and for suggesting the related robustness check.

Table 9

Changes in Tender Offer Prices and Fairness Offer Valuation Disclosures

	Full Sample	1995–2007	2008–19
Constant	20.442*	20.153**	9.359
	(.016)	(.006)	(.203)
Log Transaction Value	.109	−.284	.143
	(.701)	(.251)	(.760)
Cross Industry	−.268	−.635	.265
	(.696)	(.458)	(.817)
Target Delaware Incorporated	−1.034	−.913	−.759
	(.196)	(.180)	(.561)
Low Offer	2.230+	1.181+	15.239
	(.094)	(.093)	(.383)
FO Valuations Disclosed	−.863	1.089	−10.485*
	(.586)	(.360)	(.045)
FO Valuations Disclosed × Low Offer	.124	4.628*	−15.166
	(.929)	(.036)	(.379)
N	914	560	354
R^2	6.86	13.23	20.56

Note. Results are from ordinary least squares regressions with a dependent variable equal to Tender Offer Percentage Change × 100 and *p*-values from robust standard errors in parentheses. The variable FO Valuations Disclosed equals one if the valuation details are provided and zero otherwise.
+ Significant at the 10% level.
* Significant at the 5% level.
** Significant at the 1% level.

ficients are offsetting and sum to approximately 0. Thus, contrary to our findings among tender offers, the mandatory-disclosure regime affecting mergers in 1995–2007 appears to have eliminated the information benefit of these detailed disclosures.

Table 8 reveals a similarly insignificant coefficient on DCF Valuation × Low Offer for 2008–19. While the coefficient on DCF Valuation is positive and statistically significant, the magnitude is roughly the same as that of the interaction term, which indicates that the details of the valuation have no meaningful effect on changes in merger offer price among low-offer deals. Thus, the pattern among tender offers—declining informativeness of disclosures over time—does not appear among the mergers in the mandatory-disclosure regime. As a result, our primary findings do not appear to be driven by this type of endogeneity.

Consistent with economic theory, targets appear to be utilizing the disclosure of fairness opinions to provide information to shareholders and other bidders about an offer's quality. Table 9 examines subsequent revisions to initial tender offer prices when voluntary disclosure of a fairness opinion is made.

For 1995–2007, the coefficient on the interaction of Low Offer and FO Valuations Disclosed is positive and statistically significant at the 5 percent level. In

Table 10

Rankings of Target-Side Law Firms and Financial Advisors

	Rank	*N*
Target law firm:		
Skadden, Arps, Slate, Meagher, & Flom	1	105
Sullivan & Cromwell	2	77
Latham & Watkins	3	63
Simpson Thacher & Bartlett	4	47
Gibson, Dunn & Crutcher	5	46
Target financial advisor:		
Goldman Sachs	1	88
Morgan Stanley	2	65
JP Morgan	3	42
Credit Suisse First Boston	4	24
Bear Stearns	5	22

Note. Rankings are based on an equal-weighted number of tender offer deal engagements. Multiple law firms, but not multiple financial advisors, are listed for a given deal in the majority of observations.

other words, during the time period of considerable discretion over disclosure, voluntary disclosure is associated with an increase in tender offer bids when the initial bid is low. The coefficient on this interaction term implies an increase of about 4.6 percent in the offer premium.[7]

For 2008–19, when disclosure became more uniform, the disclosure effect disappears. While the coefficient on disclosure is negative and significant, the sum of the coefficients on the low-offer indicator, the disclosure indicator, their interaction, and the constant term amount to roughly 0.

Accordingly, Table 9 shows that the beneficial effect of disclosure is concentrated within the time period of considerable heterogeneity in voluntary disclosure. This provides further evidence that voluntary disclosure is used by targets in a strategic nature in line with theories about the effectiveness of voluntary-disclosure regimes (Ekmekci and Kos 2014, 2016).

Our empirical results thus indicate that voluntary disclosure can benefit shareholders when the information produced is value relevant. We next explore factors related to the choice to disclose voluntarily. One driver of disclosure may be a legal or financial advisor. Consistent with studies concerning advisors' reputations (Kisgen, Qian, and Song 2009; Liu 2020), targets may be more willing to disclose a fairness opinion if they have a top-tier advisor. This disclosure can signal the quality of the deal and of the underlying analysis.

We first compile rankings of top legal and financial advisors in our sample, which are reported in Table 10. Rankings are determined by the equal-weighted number of target-side engagements for each financial advisor and law firm. Each

[7] We examine arbitrage spreads to assess whether they are consistent with the expectation of a price increase in low-premium deals. Spreads are lower for low-premium deals, which suggests that traders expect a price increase in those deals.

Table 11
Factors Related to Disclosure of Valuation Details

	(1)	(2)	(3)	(4)
Constant	−.358	2.354+	2.744	2.519+
	(.772)	(.078)	(.047)	(.064)
Log Transaction Value	.215**	−.158	−.196+	−.193+
	(.002)	(.140)	(.073)	(.085)
Cross Industry	.164	−.091	−.056	−.051
	(.336)	(.702)	(.813)	(.832)
Target Delaware Incorporated	−.354*	−.400+	−.428+	−.399+
	(.030)	(.074)	(.055)	(.076)
Low Offer	.303+	.422+		.428+
	(.074)	(.085)		(.080)
Top 5 Law			−.040	−.055
			(.851)	(.798)
Top 5 Finance			.410+	.416+
			(.072)	(.069)
Conflict	1.417**	.651+	.706+	.689+
	(.000)	(.072)	(.052)	(.062)
Year fixed effects	No	Yes	Yes	Yes
Pseudo-R^2	7.06	43.41	43.37	43.69

Note. Results are from logit models with a dependent variable equal to one if a tender offer statement discloses valuation details and p-values from robust standard errors in parentheses. Tender offers from 1995 through 2014 are included. All regressions include individual fixed effects. The indicator variables Top 5 Law and Top 5 Finance are for the top-ranked law firms and investment banking advisors. The indicator variable Conflict is equal to one if the transaction involved a financial sponsor, management involvement, or an acquirer-side leveraged buyout. $N = 802$.
+ Significant at the 10% level.
* Significant at the 5% level.
** Significant at the 1% level.

firm is given full credit for a deal when multiple firms are listed. We note that the SDC Platinum database tends to list multiple law firms for targets in given deals more frequently than multiple financial advisors; thus, engagement numbers are higher for the law firm rankings. The top law firms and financial advisors are broadly consistent with rankings produced in prior research (Cain and Denis 2013; Badawi and Webber 2015).

Table 11 explores whether top financial advisors or law firms tend to push for more or less disclosure for transactions from 1995 through 2014, as disclosure rates were 100 percent for 2015 and after. There is no relation between top-tier law firms and disclosure rates in any model. However, top-tier target-side financial advisors tend to have higher rates of voluntary disclosure. This is perhaps unsurprising given that investment banks produce the fairness opinions and conduct the valuation analyses. They are thus in the best position to weigh the potential costs and benefits of voluntary disclosure.

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Table 12
Valuation Disclosure Rates over Time by Offer Premium

	High Offers	Low Offers
1995–99	6.3	21.6
2000–2004	29.6	34.7
2005–9	71.8	65.9
2010–14	93.6	94.0
2015–19	98.8	100.0

Note. Results are for average rates of valuation disclosures.

Delaware-incorporated targets are also less likely to engage in voluntary disclosure of valuation details. This may be because these targets are larger and tend to have more experienced advisors that regularly engage in and are aware of the possible value of disclosure. Disclosure is also more likely among low initial tender offer bids, consistent with prior results. Consistent with Liu (2020), Table 11 also shows that firms are more likely to release the details of fairness opinions when the tender offer involves a potential conflict of interest among shareholders.[8]

The evolution of disclosure choices over time is reported by subsample in Table 12. There are significant differences in disclosure rates between high and low initial offers during the early sample period. In 1995–99, high bids are associated with valuation details being disclosed only 6.3 percent of the time, while low offers saw disclosures 21.6 percent of the time. This difference narrowed to 29.6 percent of high bids versus 34.7 percent of low bids in 2000–2004. Disclosure rates generally converged by the last decade of our sample period. This time trend is consistent with the eroding benefits of voluntary disclosure as information production became more standard and uniform in the 2000s.

4. Conclusion

We utilize the changing nature of Delaware's disclosure requirements for fairness opinions in tender offers to assess the benefits of voluntary versus mandatory disclosure. In this unique setting we find that targets leverage the voluntary and heterogenous nature of disclosure to signal low offers and obtain higher bids. This effect goes away once disclosure is effectively mandatory, a finding consistent with theories of the effects of mandatory disclosure in harmonizing its nature and removing its signaling effect. Our results have implications for the disclosure requirements surrounding fairness opinions, including whether Delaware and federal rules should mandate the disclosure of fairness opinions and financial information generally, and the effects of voluntary versus mandatory disclosure.

[8] We thank a referee for this suggestion.

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References

Badawi, Adam B., and David Webber. 2015. Does the Quality of the Plaintiffs' Law Firm Matter in Deal Litigation? *Journal of Corporation Law* 41:359–391.

Betton, Sandra, and B. Espen Eckbo. 2000. Toeholds, Bid Jumps, and Expected Payoffs in Takeovers. *Review of Financial Studies* 13:841–82.

Boone, Audra, Brian Broughman, and Antonio J. Macias. 2018. Shareholder Approval Thresholds in Acquisitions: Evidence from Tender Offers. *Journal of Corporate Finance* 53:225–45.

Brandeis, Louis D. 1913. What Publicity Can Do. *Harper's Weekly*, December 20, pp. 10–13.

Brown, Stephen V., and Jennifer Wu Tucker. 2011. Large-Sample Evidence on Firms' Year-over-Year MD&A Modifications. *Journal of Accounting Research* 49:309–46.

Brown, William O., Jr., J. Tingting Liu, and J. Harold Mulherin. 2022. The Development of the Takeover Auction Process: The Evolution of Property Rights in the Modern Wild West. *Journal of Law and Economics* 65:715–51.

Cain, Matthew D., and David J. Denis. 2013. Information Production by Investment Banks: Evidence from Fairness Opinions. *Journal of Law and Economics* 56:245–80.

Coffee, John C., Jr. 1984. Market Failure and the Economic Case for a Mandatory Disclosure System. *Virginia Law Review* 70:717–53.

Comment, Robert, and Gregg A. Jarrell. 1987. Two-Tier and Negotiated Tender Offers: The Imprisonment of the Free-Riding Shareholder. *Journal of Financial Economics* 19:283–310.

Davidoff, Steven M. 2006. Fairness Opinions. *American University Law Review* 55:1557–1625.

Davidoff, Steven M., and Claire A. Hill. 2013. Limits of Disclosure. *Seattle Law Review* 36:599–637.

Eaton, Gregory W., Feng Guo, Tingting Liu, and Micah S. Officer. 2022. Peer Selection and Valuation in Mergers and Acquisitions. *Journal of Financial Economics* 146:230–55.

Eaton, Gregory W., Tingting Liu, and Micah S. Officer. 2021. Rethinking Measures of Mergers and Acquisitions Deal Premiums. *Journal of Financial and Quantitative Analysis* 56:1097–1126.

Ekmekci, Mehmet, and Nenad Kos. 2014. Value of Information and Fairness Opinions in Takeovers. Working Paper No. 510. Bocconi University, Department of Economics, Milan.

———. 2016. Information in Tender Offers with a Large Shareholder. *Econometrica* 84:87–139.

Hill, Claire A., Brian J. M. Quinn, and Steven Davidoff Solomon. 2019. *Mergers and Acquisitions: Law, Theory, and Practice*. 2d ed. St. Paul, MN: West Academic.

Hirshleifer, David, and I. P. L. Png. 1989. Facilitation of Competing Bids and the Price of a Takeover Target. *Review of Financial Studies* 2:587–606.

Kisgen, Darren J., Jun "QJ" Qian, and Weihong Song. 2009. Are Fairness Opinions Fair? The Case of Mergers and Acquisitions. *Journal of Financial Economics* 91:179–207.

Liu, Tingting. 2020. The Information Provision in the Corporate Acquisition Process: Why Target Firms Obtain Multiple Fairness Opinions. *Accounting Review* 95:287–310.

Offenberg, David, and Christo Pirinsky. 2015. How Do Acquirers Choose between Mergers and Tender Offers? *Journal of Financial Economics* 116:331–48.

Paredes, Troy A. 2003. Blinded by the Light: Information Overload and Its Consequences

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for Securities Regulation. *Washington University Law Quarterly* 81:417–85.
Polinsky, A. Mitchell, and Steven Shavell. 2012. Mandatory versus Voluntary Disclosure of Product Risks. *Journal of Law, Economics, and Organization* 28:360–79.
Rohrbacher, Blake, and John Mark Zeberkiewicz. 2008. Fair Summary: Delaware's Framework for Disclosing Fairness Opinions. *Business Lawyer* 63:881–905.
Shaffer, Matthew. 2019. Truth and Bias in M&A Target Fairness Valuations: Appraising the Appraisals. PhD diss. Harvard Business School.
Walkling, Ralph A. 1985. Predicting Tender Offer Success: A Logistic Analysis. *Journal of Financial and Quantitative Analysis* 20:461–78.